

REMARKS

Claims 2 and 4-21 are all the claims pending in the application.

I. The Objection to Claims 2, 6 and 7

Claims 2, 6 and 7 are objected to for alleged informalities. In particular, the Examiner requests that "formula (I)" should be changed to --formula (I')--.

Claims 2, 6 and 7 have been amended for clarity to make the correction requested by the Examiner. In view thereof, it is respectfully submitted that Applicants' claims are clear and definite and it is requested that the objection to the claims be reconsidered and withdrawn.

II. The Rejection Based on Urano et al in view of Kobayashi et al

Claims 2, 4, 6-10 and 12-21 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Urano et al in view of Kobayashi et al.

Claims 5 and 11 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Urano et al, in view of Kobayashi et al, further in view of Tan et al.

Applicants respectfully submit that the present invention is not obvious over the disclosures of Urano et al and Kobayashi et al, alone or further in view of Tan et al, and request that the Examiner reconsider and withdraw these rejections in view of the following remarks.

Applicants respectfully traverse the Examiner's position that it would have been obvious to one of ordinary skill in the art to modify a resist composition containing an acetal group containing a small size group, such as an ethyl group, with a large size group, such as a benzyl group. For example, in a p-hydroxystyrene base resin, the properties of a chemical amplification resist composition significantly change by the replacement of a small size group such as an ethyl group with a large size group such as a benzyl group in the acetal group. That is, there is a remarkable difference in the properties between a composition that comprises a resin having a small size acetal group containing an ethyl group and a composition that comprises a resin having a bulky acetal group. Accordingly, Applicants respectfully submit that the replacement of an ethyl group with a benzyl group would not have been obvious to one of ordinary skill in the art.

Further, as can be clearly seen from a comparison between Comparative Example 2 (using the resin containing ethylacetal groups: ethyl group) and Example 1 (using the resin containing cyclohexylacetal groups: cyclohexyl group) or a comparison between Comparative Example 2 and Example 14 (using the resin containing benzylacetal groups: benzyl group) in the present specification, there are considerable and unexpected differences in the pitch (Iso/Dense) difference ΔCD and the exposure latitude between the case of using the resin containing ethylacetal

groups and the case of using the resin containing cyclohexylacetal or benzylacetal groups.

An object of the present invention relates to the finding that an unexpected synergistic effect is produced by combined use of a photo-acid generator (b-1) and a photo-acid generator (b-2) in the resist composition using a p-hydroxystyrene resin containing bulky acetal groups. The unexpected improvements obtained by the present invention are not obvious from combination of Urano with Kobayashi, wherein a p-hydroxystyrene base resin containing ethylacetal groups is used.

Although the Examiner asserts that Urano, which is silent on the photo-acid generator (b-2), may be combined with Kobayashi to supplement the type photo-acid generator (b-2), the combinations of the photo-acid generator (b-2) with the p-hydroxystyrene resin containing ethylacetal groups corresponds to the composition described as Comparative Example 2 in the present specification. Such a case is outside of the scope of the present invention.

Urano corresponds to Comparative Example 3 described in the present specification. This comparative example uses only the photo-acid generator (b-1), capable of contributing to decomposition of the acid-decomposable resin. Comparisons between Comparative Example 3 and Examples 1 and 2 of the Invention (wherein the photo-acid generator (b-1) capable of contributing to decomposition of the acid-decomposable resin is used in combination with the photo-

acid generator (b-2) incapable of contributing to decomposition of the acid-decomposable resin) prove that the addition of the photo-acid generator (b-2) produces unexpected superiority.

The disclosures of Tan et al do not overcome the deficiencies in the primary references Urano et al and Kobayashi et al.

For the above reasons, it is respectfully submitted that the subject matter of claims 2 and 4-21 is neither taught by nor made obvious from the disclosures of Urano et al and Kobayashi et al, either alone or in combination with Tan et al, and it is requested that the rejection under 35 U.S.C. §103(a) be reconsidered and withdrawn.

III. The Rejections Based on Toshiaki et al in view of Kobayashi et al

Claims 2, 4-10 and 12-21 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Toshiaki et al in view of Kobayashi et al.

Claim 11 is rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Toshiaki et al in view of Kobayashi et al and further in view of Tan et al.

Applicants respectfully submit that the present invention is not obvious over the disclosures of Toshiaki et al and Kobayashi et al, alone or in view of Tan et al, and request that the Examiner reconsider and withdraw this rejection in view of the following remarks.

As discussed in Section II above, an object of the present invention consists in a finding that an unexpected synergistic effect is produced by combined use of a photo-acid generator (b-1) and a photo-acid generator (b-2) in the resist composition using a p-hydroxystyrene resin containing bulky acetal groups. Therefore, although the Examiner asserts that the present invention is obvious from the combination of Toshiaki, which makes no suggestion about the photo-add generator (b-2), with Kobayashi, Applicants respectfully submit that the present invention would not have been obvious to one of ordinary skill in the art.

The unexpected effects produced by Applicants' invention by addition of the photo-acid generator (b-2) can be clearly demonstrated from comparisons between Comparative Example 3 and Examples 1 and 2 (Comparative Example 3: independent use of the photo-acid generator (b-1) capable of contributing to decomposition of acid-decomposable resin; Examples 1 and 2: combined use of the photo-acid generator (b-1) capable of contributing to decomposition of acid-decomposable resin and the photo-acid generator (b-2) incapable of contributing to decomposition of acid-decomposable resin).

It is theorized by the present inventors that the addition of the photo-acid generator (b-2) incapable of contributing to decomposition of acid-decomposable resin controls diffusion of the acid produced by the photo-acid generator (b-1) (inhibits invasion of the acid into unexposed areas) and enhances dissolution

contrast between exposed and unexposed areas; as a result, the present effects are achieved. Further, Applicants respectfully submit that the combined use of the photo-add generators (b-1) and (b-2) goes beyond having merely additive effect, but rather relates to producing an effect specific thereto.

The disclosures of Tan et al do not overcome the deficiencies in the primary references Toshiaki and Kobayashi et al.

For the above reasons, it is respectfully submitted that the subject matter of claims 2 and 4-21 is neither taught by nor made obvious from the disclosures of Toshiaki et al and Kobayashi et al, alone or in view of Tan et al, and it is requested that the rejection under 35 U.S.C. §103(a) be reconsidered and withdrawn.

IV. Conclusion

In view of the above, Applicants respectfully submit that their claimed invention is allowable and ask that the objection to the claims and the rejections under 35 U.S.C. §103 be reconsidered and withdrawn. Applicants respectfully submit that this case is in condition for allowance and allowance is respectfully solicited.

If any points remain at issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the local exchange number listed below.

AMENDMENT UNDER 37 C.F.R. §1.111
U.S. Appln. No. 09/748,198

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

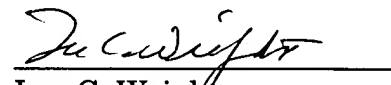
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APPENDIX
VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

The claims are amended as follows:

2 (Three times Amended). The positive-working radiation-sensitive composition according to claim 21, wherein said resin (a) comprises repeating units, each containing a hydroxystyrene group, wherein at least a part of the hydroxy groups of the hydroxystyrene groups of the repeating units are protected by said acid-decomposing group of formula [(I)] (I').

6 (Twice Amended). The positive-working radiation-sensitive composition according to claim 2, wherein from 5 to 45 mol% of the hydroxy groups of the hydroxystyrene groups of the repeating units of the resin (a) are protected by said acid-decomposing group of formula [(I)] (I').

7 (Twice Amended). The positive-working radiation-sensitive composition according to claim 2, wherein from 10 to 30 mol% of the hydroxy groups of the hydroxystyrene groups of the repeating units of the resin (a) are protected by said acid-decomposing group of formula [(I)] (I').